

### **Amendments to the Claims:**

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ and/or in ~~[[double brackets]]~~ if the deletion would be difficult to see.

### **LISTING OF CLAIMS:**

1. (Previously presented) A system for determining a temperature of exhaust gases from an engine, comprising
  - an exhaust gas sensor having an electric heating coil, said sensor communicating with the exhaust gases;
  - an electrical circuit for generating a signal indicative of the resistance of said heating coil when said coil is de-energized;
  - a controller receiving said signal and calculating said temperature of said exhaust gases based on said signal, where the controller generates a duty cycle to successively energize and de-energize said coil, and where the controller calculates said temperature during a plurality of successive de-energized periods of the duty cycle, the heater being operated to heat the sensor when it is below its desired operating temperature; and
  - a switching circuit for coupling the electrical circuit to the electric heating coil during said de-energizing of the coil, and uncoupling the electric circuit from the electric heating coil during said energizing of the coil.

2. (Original) The system of claim 1 wherein said electrical circuit comprises a Wheatstone bridge circuit operatively coupled to said exhaust gas sensor.

3. (Previously presented) A method for determining a temperature of exhaust gases from an engine, comprising:

generating a duty cycle to successively energize and de-energize a heating coil in an exhaust gas sensor, the heater being operated to heat the sensor when it is below its desired operating temperature, and where the heating coil is coupled in series with a measuring resistance circuit during said de-energizing, and the heating coil uncoupled with the measuring resistance circuit during said energizing;

generating a signal indicative of a resistance of said heating coil during a plurality of successive de-energized periods of the duty cycle; and

calculating a temperature of the exhaust gases based on said signal.

4. (Currently amended) A system for determining a temperature difference of exhaust gases from an engine, the engine being coupled to an emission catalyst, the system comprising:

a first exhaust gas sensor having a first electric heating coil, said first sensor communicating with exhaust gases upstream of the catalyst;

a second exhaust gas sensor having a second electric heating coil, said second sensor communicating exhaust gases downstream of the catalyst;

a first electrical circuit generating a first signal indicative of a resistance of said first heating coil when said first coil is not energized;

a second electrical circuit generating a second signal indicative of the resistance of said second heating coil when said second coil is not energized;[[,]]

a controller calculating a temperature difference between exhaust gases communicating with said first and second exhaust gas sensors based on said first and second signals, where the controller generates respective duty cycles to successively energize and de-energize said respective coils, and where the controller calculates said temperatures during a plurality of respective successive de-energized periods of the duty cycles; and

a switching circuit for coupling one of the first and second electrical circuits to one of the first and second electric heating coils during de-energizing, and uncoupling the one of the first and second electric circuits from the one of the first and second electric heating coils during energizing of the coil.

5. (Previously presented) A system for determining a temperature difference of exhaust gases from an engine, the engine being coupled to an emission catalyst, the system comprising:

a first exhaust gas sensor having a first electric heating coil, said first sensor communicating with exhaust gases upstream of the catalyst;

a second exhaust gas sensor having a second electric heating coil, said second sensor communicating exhaust gases downstream of the catalyst;

an electrical circuit coupled to both the first and second electric heating coil, the circuit generating a first signal based on both a resistance of said first sensor heating coil and a resistance of said second sensor heating coil;

a controller calculating a temperature difference between exhaust gases communicating with said first and second exhaust gas sensors based on said first signal; and

a switching circuit for coupling one of the first and second electrical circuits to one of the first and second electric heating coils during de-energizing, and uncoupling the one of the first and second electric circuits from the one of the first and second electric heating coils during energizing of the coil.

6-15. (Cancelled)

16. (Previously presented) The system of claim 1 where the electrical circuit includes a measuring resistance.